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Substitute for form 1449/PTO

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Sheet 1

of 25

Complete if Known

Application Number	09/903,412
Filing Date	July 11, 2001
First Named Inventor	Shohei Koide
Art Unit	1639
Examiner Name	Teresa D. Wessendorf
Attorney Docket Number	17027.003US1

U. S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
TDW	US-	6,348,584	02-19-2002	Hodgson et al.	
	US-	6,673,901	01-09-2004	Koide	
	US-	6,703,199	03-09-2004	Koide	
	US-	6,462,189	10-08-2002	Koide	
	US-	6,391,855	05-21-2002	Blaschuk et al.	
	US-	6,818,418	11-15-2004	Lipovsek et al.	
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	US-	2003/0108948	06-12-2003	Koide	
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	US-	2003/0170753	09-11-2003	Koide	
	US-	2003/0186385	10-02-2003	Koide	
	US-	2004/0259155	12-23-2004	Chan et al.	
W	US-	2005/0038229	02-17-2005	Lipovsek et al.	
	US-				

FOREIGN PATENT DOCUMENTS

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TDW		WO-94/24278	10-27-1994	Davis, Claude		
		WO-95/27045	10-12-1995	Smith, Rodger.G.		
		WO-94/18221	08-18-1994	Barbas et al.		
		WO-98/56915	12-17-1998	Koide, Shohei		
		WO-00/34784	06-15-2000	Lipovsek, Dasa		
		JP-8-511417	03-12-1996	Davis et al.		

Examiner Signature	T. D. - 1	Date Considered	10/26/05
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Tdw		WO-01/64942	09-07-01	Lipovsek et al
		WO-04/019878	03-11-04	Afeyan et al.
		WO-05/056764	06-23-05	Chen et al.

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T. D. Alessop

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Sheet 3	of 25	Attorney Docket Number	17027.003US1		

NON PATENT LITERATURE DOCUMENTS				
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		
TKW		Alzari et al., "Three-dimensional structure of antibodies," Annu. Rev. Immunol., 1998, 555-580		
		Archer et al., "An alternative 3D NMR technique for correlating backbone 15N with side chain Hb resonances in large proteins," J. Magn. Reson., 1991, 95:636-641		
		Aukhil et al., "Cell-and heparin-binding domains of the hexabrachion arm identified by tenascin...," J. Biol. Chem. 1993, 268:2542-2553		
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		Baron et al., "H NMR assignment and secondary structure of the cell adhesion type III module of fibronectin," Biochemistry, 1992, 31:2068-2073		
		Bass et al., "Hormone phage: An enrichment method for variant proteins with altered binding properties," Proteins: Struct. Funct. Genet., 1990, 8:309-314		
		Bax and Grzesiek, "Methodological advances in protein NMR," Acc. Chem. Res., 1993, 26:131-138		
✓		Bazan, J.F., "Structural design and molecular evolution of a cytokine receptor superfamily", Proc. Natl. Acad. Sci. USA, vol. 87, 6934-6938, (Sep. 1990).		

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Sheet	4	of	25	Attorney Docket Number	17027.003US1

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TK		Becktel and Schellman, "Protein stability curves," Biopolymer 1987, 26:1859-1877		
		Berggard et al., "Fragment complementation studies of protein stabilization by hydrophobic core residues," Biochemistry, 2001, 40:1257-1264		
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WV		Boder and Wittrup, "Yeast surface display for directed evolution of protein expression, affinity, and stability," Methods Enzymol., 2000, 328:430-444		

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Sheet 5	of 25	Attorney Docket Number	17027.003US1

NON PATENT LITERATURE DOCUMENTS			
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<i>T.D.W.</i>		Burke et al., Phage display of peptides and proteins, 1996, (Kay et al., Ed.), pp. 305-326, Academic Press, San Diego	
		Burgess et al., The Journal of Cell Biology 111:2129-38, 1990.	
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<i>X</i>		Conrath et al., "Camel Single-domain antibodies as modular building units in bispecific and bivalent antibody constructs," J. Biol. Chem. 276(10):7346-7350 (2001).	

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Sheet 6	of 25	Attorney Docket Number	17027.003US1		

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T.D.		Connolly, "Solvent-accessible surfaces of proteins and nucleic acids," Science, 1983, 221:709-713			
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TDW		de Prat Gay and Fersht, "Generation of a family of protein fragments for structure-folding studies....," Biochemistry, 1994, 33:7957-7963	
		Desiderio, A., et al., "A semi-synthetic repertoire of intrinsically stable antibody fragments...," J. Mol. Biol., vol. 310, pp. 603-615 (2001)	
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		Doolittle, R.F., "The multiplicity of domains in proteins", Annu. Rev. Biochem., vol. 64, 287-314, (1995).	
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T. D.		Ely, K.R., et al., "Common Molecular Scaffold for Two Unrelated RGD Molecules", Protein Engineering, 8, 823-827 (1995).			
		Farrow et al., "Backbone dynamics of a free and phosphopeptide-complexed Src homology 2 domain studied by 15N NMR relaxation," Biochemistry, 1994, 33:5984-6003			
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U		Green, S.M., et al., "Contributions of the polar, uncharged amino acids..." Biochemistry, 31(25), 5717-5728, (1992).			

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TDW		Gribskov et al., "The codon preference plot: graphic analysis of protein coding sequences and prediction of gene expression," Nuc. Acids. Res., 1984, 12:539-549	
		Grimsley et al., Protein Sci., 1999, 8:1843-1849	
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		Gronenborn and Clore, "Identification of the contact surface of a Streptococcal protein G domain complexed with a human Fc fragment," J. Mol. Biol., 1993, 233:331-335	
		Grumet et al., The Journal of Cell Biology 113:1399-1412, 1991.	
		Grzesiek et al., "Correlation of backbone amide and aliphatic side-chain resonances in 13C/15N-enriched proteins...," J. Magn. Reson. B, 1993, 101:114-119	
		Grzesiek and Bax, "Correlating backbone amide and side chain resonances in larger proteins by multiple relayed triple resonance NMR," J. Am. Chem. Soc., 1992, 114:6291-6293	
		Grzesiek and Bax, "Amino acid type determination in the sequential assignment procedure of uniformly 13C/15N-enriched proteins," J. Biomol. NMR, 1993, 3:185-204	
		Gyuris et al., "Cdil, a human G1 and S phase protein phosphatase that associates with Cdk2," Cell, 1993, 75:791-803	
↓		Harpez and Chothia, "Many of the immunoglobulin superfamily domains in cell adhesion molecules ...," Mol. Biol., 1994, 238:528-539	

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				Filing Date	July 11, 2001
				First Named Inventor	Shohei Koide
				Art Unit	1639
				Examiner Name	Teresa D. Wessendorf
Sheet	10	of	25	Attorney Docket Number	17027.003US1

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TM		Hawkins et al., "The contribution of contact and non-contact residues of antibody in the affinity...", Mol. Biol., 1993, 234:958-964			
		Hawkins et al., "Selection of phage antibodies by binding affinity. Mimicking affinity maturation," J. Mol. Biol., 1992, 226:889-896			
		Helms et al., Protein Science 4:2073-81, 1995.			
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		Hendsch et al., Biochemistry, 1996, 35:7621-7625			
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		Hennecke et al., "Random circular permutation of DsbA reveals segments that are essential for protein folding and stability," J Mol Biol., 1999, 286:1197-1215			
		Hoess, "Protein design and phage display," Chem Rev., 2001, 101:3205-3218			
		Holliger, P., et al., ""Diabodies": Small bivalent and bispecific antibody fragments", Proc. Natl. Acad. Sci. USA, 90, 6444-6448 (1993).			
↓		Holm, L. et al., "Mapping the protein universe", Science, vol. 273, p. 595-602, (Aug. 2, 1996).			

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TW		Holm, L., et al., "FSSP: select structural ...", Science, 273(5275) :595-60 http://jura.ebi.ac.uk:8765/holm/qz?filename=/data/research/fssp//fnf. fssp, 3 pages (1996)			
		Honda et al., "Fragment reconstitution of a small protein: folding energetics of the reconstituted immunoglobulin...", Biochemistry, 1999, 38:1203-1213			
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		Janda, K.D., et al., "Chemical Selection for Catalysis in Combinatorial Antibody Libraries", Science, 275, 945-948 (1997).			
		Johnson and Blevins, J. Biomol. NMR, 1994, 4:603-614			
		Johnsson and Varshavsky, "Split ubiquitin as a sensor of protein interactions in vivo," Proc Natl Acad Sci USA, 1994, 91:10340-10344			
↓		Jones, "The immunoglobulin superfamily," Curr. Opinion Struct. Biol., 1993, 3:846-852			

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<i>tdw</i>		Jones et al., "Replacing the complementarity-determining regions in a human antibody with those from a mouse," <i>Nature</i> , 1986, 321:522-525	
		Jourdan and Searle, "Cooperative assembly of a nativelike ubiquitin structure through peptide fragment complexation...", <i>Biochemistry</i> , 2000, 39:12355-123640	
		Kabsch and Sander, "Dictionary of protein secondary structure: pattern recognition of hydrogen-bonded and geometrical features," <i>Biopolymers</i> , 1983, 22:2577-2637	
		Kamtekar et al., "Protein design by binary patterning of polar and nonpolar amino acids," <i>Science</i> , 1993, 262(5140):1680-1685	
		Kapust et al., "Tobacco etch virus protease: mechanism of autolysis and rational design of stable mutants with wildtype catalytic proficiency," <i>Protein Eng.</i> , 2001, 14:993-1000	
		Kauzmann, <i>Adv. Prot. Chem.</i> , 1959, 14:1-63	
		Kay, "Field gradient techniques in NMR spectroscopy," <i>Curr. Opinion Struct. Biol.</i> , 1995, 5:674-681	
		Kay et al., "Pure absorption gradient enhanced heteronuclear single quantum correlation spectroscopy with improved sensitivity," <i>J. Am. Chem. Soc.</i> , 1992, 114:10663-10665	
		Kay et al., "Backbone dynamics of proteins as studied by ¹⁵ N inverse detected heteronuclear NMR spectroscopy...", <i>Biochemistry</i> , 1989, 28:8972-8979	
<i>✓</i>		Kay, "Pulsed-Field Gradient-Enhanced Three-Dimensional NMR Experiment for Correlating...", <i>J. Am. Chem. Soc.</i> 1993, 115:2055-2057.	

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<i>TDW</i>		Kay et al., "A Gradient-Enhanced HCCH-TOCSY Experiment for Recording Side-Chain 1H and 13C Correlations in H2O Samples of Proteins," J. Magn. Reson. B, 1993, 101:333-337			
<i>TDW</i>		Kippen et al., "Folding of barnase in parts," Biochemistry, 1994, 33:3778-3786			
		Kohno et al., "A new general method for the biosynthesis of stable isotope-enriched peptides using a decahistidine-tagged ...," J. Biomol. NMR, 1998, 12:109-121			
		Koide et al., "Characterization of a folding intermediate of apoplastcyanin trapped by proline isomerization," Biochemistry, 1993, 284:12299-12310			
		Koide et al., "The fibronectin type III domain as a scaffold for novel binding proteins," J. Mol. Biol., 1998, 284:1141-1151			
<i>TDW</i>		Koide, S., et al., "Directed Evolution...", Dept. of Biochemistry and Biophysics, University of Rochester Medical Center, Rochester, NY 14642. FASEB J. 11 No. 9, PA1155 (1997)			
		Koide et al., Biochemistry 1999, 38:4757-4767			
<i>TDW</i>		Koide et al., "Stabilization of a fibronectin type III domain by the removal of unfavorable electrostatic...," Biochemistry, 2001, 40:10326-10333			

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<i>TKW</i>		Koide et al., "Probing protein conformational changes in living cells by using designer binding proteins: Application to the estrogen receptor," PNAS, 2002, 99:1253-1258	
<i>T</i>		Komblieht et al., "Primary structure of human fibronectin: differential splicing may generate at least 10 polypeptides from a single gene," EMBO J., 1985, 4:1755-1759	
<i>D</i>		Kraulis, "MOLSCRIPT: a program to produce both detailed and schematic plots of protein structures" J. Appl. Cryst., 1991, 24:946-950	
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		Lazar et al., Molecular and Cellular Biology 8:1247-1252, 1988. 8(3):1247-1252	
		Leahy et al., Cell, 1996, 84:155-164	
<i>↓</i>		Leahy et al., "Structure of a fibronectin type III domain from tenascin phased by MAD analysis of the selenomethionyl protein," Science, 1992, 258:987-991	

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T.D.		Lee, G., et al., "Strong Inhibition of Fibrinogen Binding to Platelet Receptor .alpha..sub.IIb.beta..sub.3 by RGD Sequences...", Protein Engineering, 6, 745-754 (1993).			
^		Lee et al., "Three-dimensional solution structure of a single zinc finger DNA-binding domain," Science, 1989, 245:635-637			
		Lee et al., "A pulsed field gradient isotope-filtered 3D 13C HMQC-NOESY experiment for extracting intermolecular NOE contacts...", FEBS Lett., 1994, 350:87-90			
		Lerner, R.A., et al., "Using the Proces of Reactive Immunization to Induce Catalytic Antibodies...", Acta Chemica Scandinavica, 50, 672-677 (1996).			
		Li, B., et al., "Minimization of Polypeptide Hormone", Science, 270, 1657-1660 (1995). Martin, F., et al., "The affinity-selection...", EMBO J., 13, 5303-5309 (1994).			
		Lin et al., Biochemistry 14:1559-1563, 1975			
		Litvinovich et al., "Reversible unfolding of an isolated heparin and DNA binding fragment the first type III module from fibronectin," Biochim. Biophys. Acta, 1992, 1119:57-62			
		Logan et al., "Side chain and backbone assignments in isotopically labeled proteins from two heteronuclear triple resonance experiments," FEBS Lett., 1992, 314,:413-418			
		Loladze et al., Biochemistry, 1999, 38:16419-16423			
✓		Lowman et al., Biochemistry, 1991, 30:10832-10838			

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TW		Main et al., "The three-dimensional structure of the tenth type III module of fibronectin: an insight into RGD-mediated interactions," Cell, 1992, 71:671-678	
/		Malakauskas and Mayo, Nat Struct Biol., 1998, 5:470-475	
g		Marti-Renom, M.A., et al., "Comparative protein structure modeling of genes and genomes", Annu. Rev. Biophys. Biomol. Struct., vol. 29, 291-325, (2000).	
DA		Martin, M.T., "The Affinity-selection of minibody polypeptide inhibitor of human interleukin-6", EMBO J 13:5303-5309 (1994).	
W		Martin, M.T., "Commercially valuable catalytic antibodies: The life to come", Drug Discovery Today, 1, 239-247 (1996).	
~		Masat, L., et al., "A simpler sort of antibody", Proc. Natl. Acad. Sci. USA, 91, 893-896 (1994).	
1		Matthews, B.W., "Structural and genetic analysis of protein stability", Annu. Rev. Biochem., vol. 62, 139-60, (1993).	
		McCafferty et al., "Phage antibodies: filamentous phage displaying antibody variable domains," Nature, 1990, 348:552-554	
		McClain et al., "Design and Characterization of a Heterodimeric Coiled Coil that Forms Exclusively...", J. Am. Chem. Soc., 2001, 123:3151-3152	
W		McConnell, S.J., et al., "Tendamistat as a Scaffold...", Journal of Mol. Biol., 250, 460-470 (1995).	

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T.D.		Merkel and Regan, "Modulating protein folding rates in vivo and in vitro by side-chain interactions between the parallel beta strands," J Biol Chem., 2000, 275:29200-29206		
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		Nilges et al., "Determination of three-dimensional structures of proteins...," FEBS Lett., 1988, 229:317-324		
V		Nilges et al., Computational aspects of the study of biological macromolecule..., 1991, (Hoch, J. C., Poulsen, F. M. and Redfield, C., Ed.), pp. 451-455, Plenum Press, New York		

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				Application Number	09/903,412
				Filing Date	July 11, 2001
				First Named Inventor	Shohei Koide
				Art Unit	1639
				Examiner Name	Teresa D. Wessendorf
Sheet	18	of	25	Attorney Docket Number	17027.003US1

NON PATENT LITERATURE DOCUMENTS					
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.			
<i>TDW</i>		Ojennus et al., "Reconstitution of a native-like SH2 domain from disordered peptide fragments examined by multidimensional..." Protein Science, 2001, 10:2162-2175			
		Oakley et al., "A buried polar interaction can direct the relative orientation of helices in a coiled coil," Biochemistry, 1998, 37:12603-12610			
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		Pace and Scholtz, "Measuring the conformational stability of a protein," Protein structure. A practical approach, 1997, (Creighton, T. E. Ed.) pp. 299-321, IRL Press, Oxford			
		Pace et al., Faseb J., 1996, 10:75-83			
		Pace et al., Biochemistry, 1992, 31:2728-2734.			
		Parmley et al., "Antibody-selectable filamentous fd phage vectors: affinity purification of target genes," Gene, 1988, 73:305-318			
<i>↓</i>		Pascal et al., "Nuclear magnetic resonance structure of an SH2 domain of phospholipase C-gI complexed with a high affinity binding peptide," Cell, 1994b, 77:461-472			

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<i>T.D.</i>		Pascal et al., "Simultaneous acquisition of 15N-and 13C-edited NOEspectra of proteins dissolved in H ₂ O," J. Magn. Reson. B, 1994a, 103:197-201			
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		Rader and Barbas, "Phage display of combinatorial antibody libraries," Curr Opin Biotechnol., 1997, 18:503-508.			

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T.D.		Raquet et al., "Detection of altered protein conformations in living cells," J Mol Biol., 2001, 305:927-938				
\		Rees et al., "Antibody design: beyond the natural limits," Trends Biotechnol., 1994, 12:199-206				
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Sheet 21	of 25	Attorney Docket Number	17027.003US1		

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TDW		Savchenko et al., "Pyrococcus furiosus alpha-Amylase Is Stabilized by Calcium and Zinc," Biochemistry, 2002, 41:6193-6201		
		Sblattero and Bradbury, "Exploiting recombination in single bacteria to make large phage antibody libraries," Nat Biotechnol., 2000, 18:75-80		
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		Skerra, "Engineered protein scaffolds for molecular recognition," J Mol Recognit, 2000, 13:167-187		
↓		Smith and Scott, "Libraries of peptides and proteins displayed on filamentous phage," Methods Enzymol., 1993, 217:228-257		

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<i>T.D.</i>		Smith, "Filamentous fusion phage: novel expression vectors that display cloned antigens on the virion surface," <i>Science</i> , 1985, 228:1315-1317		
		Smith and Regan, "Guidelines for protein design: The energetics of α -sheet side chain interactions," <i>Science</i> , 1995, 270:980-982		
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		Studier et al., "Use of T7 RNA polymerase to direct expression of cloned genes," <i>Methods Enzymol.</i> , 1990, 185:60-89		
		Suzuki, "Recent advances in abzyme studies," <i>J. Biochem.</i> , 1994, 115:623-628		
		Tasayco and Chao, "NMR study of the reconstitution of the beta-sheet of thioredoxin by fragment complementation," <i>Proteins</i> , 1995, 22:41-44		
<i>V</i>		Tasayco et al., "Interaction between two discontiguous chain segments...," <i>Biochemistry</i> , 2000, 39:10613-10618		

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TDW		Tello et al., "Immunoglobulin superfamily interactions," Biochem. Soc. Trans., 1993, 21:943-946			
		Thomas, N.R., "Hapten Design for the Generation of Catalytic Antibodies", Applied Biochemistry and Biotechnology, 47, 345-372 (1994).			
		Timasheff, Curr. Op. Struct. Biol., 1992, 2:35-39			
		van den Beucken, T., "Building novel binding ligands to B&1 and B&2 based on human antibody single variable light chain domains", J. Mol. Biol., vol. 310, pp. 591-601 (2001)			
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		Vuister and Bax, "Resolution enhancement and spectral editing of uniformly 13C-enriched proteins by homonuclear broadband 13C decoupling," J. Magn. Reson., 1992, 98:428-435			
		Vuister et al., "Increased resolution and improved spectral quality in four-dimensional 13C/13C-separated...," J. Magn. Reson. B, 1993, 101:210-213			
		Ward et al., "Binding activities of a repertoire of single immunoglobulin variable domains secreted from Escherichia coli," Nature, 1989, 341:554-546			
W		Webster et al., "Antibody-antigen interactions," Curr. Opinion Struct. Biol., 1994, 4:123-129			

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T.D.		Williams and Barclay, Ann. Rev. Immunol., 1988, 6:381-405			T ²
		Wilson and Stanfield, "Antibody-antigen interactions," Curr. Opinion Struct. Biol., 1993, 3:113-118			
		Wilson and Stanfield, "Antibody-antigen interactions: new structures and new conformational changes," Curr. Opinion Struct Biol., 1994, 4:857-867			
		Winter, Greg, "Making Antibodies by Phage Display Technology", Ann. Rev. Immunol., 12, 433-455 (1994).			
		Wiseman et al., "Rapid measurement of binding constants and heats of binding using a new titration calorimeter," Anal. Biolchem., 1989, 179:131-137			
		Wittenkind and Mueller, "HNCACB, a high-sensitivity 3D NMR experiment to correlate amide-proton...", J. Magn. Reson. B, 1993, 101:201-205			
		Wittke et al., "Probing the molecular environment of membrane proteins in vivo," Mol Biol Cell., 1999, 10:2519-2530			
		Wu et al., "Length distribution of CDRH3 in antibodies," Proteins: Struct. Funct. Genet., 1993, 16:1-7			
		Yamazaki et al., "Segmental Isotope Labeling for Protein NMR Using Peptide Splicing," Journal of the American Chemical Society, 1998, 120(22):5591-5592			
↓		Yamazaki et al., "Two-Dimensional NMR Experiments for Correlating 13C-beta and...", J. Am. Chem. Soc., 1993, 115:11054			

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TDW		Yang and Honig, Curr. Opin. Struct. Biol., 1992, 2:40-45				
		Zhang et al., "Circular permutation of T4 lysozyme," Biochemistry, 1993, 32:12311-12318				
		Zhang et al., "Backbone 1H and 15N resonance assignments of the N-terminal SH3 domain of drk...", J. Biomol. NMR, 1994, 4:845-858				
		McIntosh et al., Biochemistry, 1996, 35:9958-9966				
✓		Li et al., "The metal ion binding properties of calreticulin...", Biochemistry, 2001, 40, 11193-12201.				

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¹ Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Shohei Koide	
		Filing Date July 11, 2001	Group Art Unit 1639

U.S. Patent Documents

Foreign Patent Documents or Published Foreign Patent Applications

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
<i>PL</i>	AB	Dickinson et al., "Active Site Modification of Factor VIIa Affects Interactions of the Protease Domain with Tissue Factor," J. Biol. Chem., 1997, 272:19875-19879

Examiner Signature <i>T - W - J</i>	Date Considered <i>10/26/05</i>
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